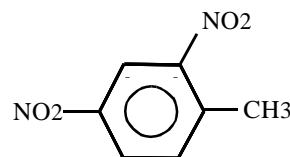


2,4-DINITROTOLUENE

2,4-Dinitrotoluene is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 121-14-2

Molecular Formula: $C_7H_6N_2O_4$



2,4-Dinitrotoluene exists as yellow to red needles or crystals, or in liquid form. It has a slight odor, and is soluble in alcohol, ether, acetone, benzene, and pyridine (HSDB, 1991).

Physical Properties of 2,4-Dinitrotoluene

Synonyms: 1-methyl-2,4-dinitrobenzene; 2,4-dinitrotoluol; dinitrotoluene; DNT; 2,4-DNT

Molecular Weight:	182.14
Boiling Point:	300 °C
Melting Point:	71 °C
Vapor Density:	6.27 (air = 1)
Vapor Pressure:	1.1×10^{-4} mm Hg at 20 °C
Log Octanol/Water Partition Coefficient:	1.98
Conversion Factor:	1 ppm = 7.45 mg/m ³

(Howard, 1990; HSDB, 1991; Sax, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

2,4-Dinitrotoluene is primarily used in the production of 2,4-diaminotoluene for isocyanate production (Howard, 1990). It is also used in the synthesis of organic chemicals, dyes, explosives, and as a propellant additive (HSDB, 1991).

B. Emissions

No emissions of 2,4-dinitrotoluene from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of 2,4-dinitrotoluene was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient concentrations of 2,4-dinitrotoluene.

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations of 2,4-dinitrotoluene was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

2,4-Dinitrotoluene is expected to be removed from the atmosphere through photolysis and/or reaction with hydroxyl radicals (Howard, 1990). Information on the products of these reactions is not available. No information on the atmospheric half-life and lifetime were found in the readily-available literature.

AB 2588 RISK ASSESSMENT INFORMATION

2,4-Dinitrotoluene emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to 2,4-dinitrotoluene are inhalation, ingestion, and dermal contact (HSDB, 1991).

Non-Cancer: 2,4-Dinitrotoluene causes methemoglobinemia and also harms the liver and kidney. Long-term inhalation exposure to 2,4-dinitrotoluene may affect the nervous system causing an unpleasant metallic taste in the mouth, muscular weakness, headache, dizziness, nausea, insomnia, vomiting, blue coloring of skin, fall in blood pressure, irregular heartbeat, anemia, and tingling pains in the extremities (Sittig, 1991; U.S. EPA, 1994a).

The United States Environmental Protection Agency (U.S. EPA) has calculated an oral Reference Dose (RfD) of 0.002 milligrams per kilogram per day based on neurotoxicity in dogs. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely

result in the occurrence of chronic, non-cancer effects. No Reference Concentration (RfC) has been established due to inadequate data (U.S. EPA, 1994a).

A significant reduction in sperm counts has been observed in human reproduction studies (U.S. EPA, 1994a).

Cancer: Animal studies showed increased renal tumors in male mice and liver tumors in rats following oral exposure to 2,4-dinitrotoluene. The U.S. EPA has classified 2,4-dinitrotoluene in Group B2: Probable human carcinogen (U.S. EPA, 1994a). The International Agency for Research on Cancer has classified 2,4-dinitrotoluene in Group 2B: Possible human carcinogen, based on sufficient evidence in animals (IARC, 1996b).

The State of California has determined under Proposition 65 that 2,4-dinitrotoluene, dinitrotoluene mixture 2,4/2,6-, and 2,6-dinitrotoluene are carcinogens (CCR, 1997). The inhalation potency factor that has been used as a basis for regulatory action in California is 8.9×10^{-5} (microgram per cubic meter)⁻¹ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of 2,4-dinitrotoluene is estimated to be no greater than 89 in 1 million. The oral potency factor that has been used as a basis for regulatory action in California is 3.1×10^{-1} (milligram per kilogram per day)⁻¹ (OEHHA, 1994).

